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10/045,806	01/10/2002	Michael Francis Arguello	02005/07PAUS	2693

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OPPENHEIMER WOLFF & DONNELLY LLP  
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MINNEAPOLIS, MN 55402

EXAMINER
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FERGUSON, DENISE

ART UNIT	PAPER NUMBER
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3623

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/045,806

Applicant(s)

ARGUELLO ET AL.

Examiner

Denise Ferguson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01/10/2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/10/2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>08/26/2002</u> . | 6) <input checked="" type="checkbox"/> Other: <u>Requirement for Information</u> .      |

### **DETAILED ACTION**

1. The following is a non-final office action in response to the communication received on January 10, 2002. Claims 1-17 are now pending in this application.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims omit variables adequate variable definitions or usage description, therefore rendering the claims indefinite. In order to provide greater context and meaning within the claims, the Applicant should include a definition of the variables recited in each claim, establish the purpose of each equation, and describe equation manipulation.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Green (US Patent No. 6192346 B1) in view of Beaumont (Scheduling Staff Using Mixed Integer Programming).

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6. As per claim 1, Green discloses a parameter driven system for generating an optimal solution in response to employee leave requests for an entire enterprise (col. 1, lines 51-54; The system schedules employee holidays and vacations. col. 3, lines 30-41; System parameters determine how the vacation scheduler handles scheduling) which comprises; receiving means for providing input data including employee data (col. 2, lines 3-8; A user may enter his or her name and password to access the scheduling request tool), parameter values (col. 3, lines 30-38; The user may enter parameters to define system behavior and direct data manipulation), configuration settings (col. 3, lines 20-27; The administration object enables the user to configure system processing rules and settings), and said leave requests from a user to generate awards to employees including said leave requests (col. 2, lines 3-8; A user may access selection utilities to select desired vacation days);.
7. Green does not expressly disclose that the system generates a solution in near real time, that the system includes an optimization processor means in electrical communication with said receiving means for generating a mixed integer programming model with decision variables and constraints from said input data, and does not expressly disclose that awards include transfer requests, new hire location assignments, and last half period new hire location assignments.
8. However, Beaumont discloses a staffing and scheduling system with an optimization processor means in electrical communication with said receiving means for generating a mixed integer programming model (pp. 483-484, section 7: Implementation; The system includes a user interface to allow data entry, configuration, data manipulation and processing, and generates a mixed integer programming model) with decision variables and constraints from said input data (p. 474, section 1.2: Past Work; The staff scheduling problem subject to a particular set of constraints is solved by expressing it as a mixed integer program and generating a solution. pp. 476-478, section 3: Formulation; Beaumont discloses multiple variables in section 3.3 and constraints in section 3.5 used in the mixed

integer model to generate a solution). Beaumont also discloses that the system generates a solution to the mixed integer program in near real time (p. 481, section 5: Results; Table 2 shows that the system generates solutions in only minutes).

9. That the system of the Applicant generates awards of transfer requests, new hire location assignments, and last half period new hire location assignments is irrelevant since the intended field of use does not change the overall functionality of the system. The system can be used to process any input data and requests as appropriate to a variety of optimization problems. The intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).
10. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to supplement the employee leave scheduling system of Green with an optimizing feature using mixed integer programming in order to efficiently and cost-effectively solve an employee scheduling and staffing problem involving numerous variables subject to certain constraints. Beaumont (pp. 483-484, section 7: Implementation) discusses the use of mixed integer programming to generate optimized staff scheduling in near real time in order to efficiently model and solve a complex management and planning problem.
11. As per claim 2, Green discloses a system for optimized processing of leave requests in managing employee staffing (col. 2, lines 6-8; The scheduling system allows an employee to select a vacation request. col. 5, lines 5-8; The vacation day calculation object processes input data to schedule vacation days), which comprises: a user interface for receiving parameter values (col. 3, lines 30-38; The user may enter parameters to define system behavior and direct data manipulation) and configuration settings from a user (col. 3, lines 20-27; The administration object enables the user to configure system processing rules and settings) and accessing said leave requests, and employee data (col. 2, lines 53-56; The

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system includes a PC workstation to enable users to interact with the system. Fig. 5-7; Users can access requests and employee data. col. 3, lines 20-27; The system can be configured to process vacation scheduling requests and data); a database in electrical communication with said user interface and having stored therein said leave requests, and said employee data (col. 2, lines 55-56; Data required by the scheduler is locally stored at the PC workstation).

12. Green does not expressly disclose receiving and processing at least one of said transfer requests from said database for generating an optimized solution in near real time, said optimized solution having at least one of awards of said transfer requests, said new hire location assignments, and said last half period new hire location assignments.
13. However, Beaumont discloses an optimization processor means in electrical communication with said user interface and receiving said parameter values, from said user (pp. 483-484, section 7: Implementation; The system includes a user interface to allow data entry, configuration, data manipulation and processing, and generates a mixed integer programming model), and at least one of said requests from said database for generating an optimized solution (p. 483, section 7: Implementation; The system stores input data for calculations) in near real time (p. 481, Table 2; Results of various runs shows that the system generates solutions in only minutes).
14. That the system of the Applicant generates awards of transfer requests, new hire location assignments, and last half period new hire location assignments is irrelevant since the intended field of use does not change the overall functionality of the system. The system can be used to process a variety of input data and requests as appropriate to a variety of optimization problems. The intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

15. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to supplement the system of Green with an optimization feature that uses mixed integer programming models in order to efficiently and cost-effectively solve a complex employee scheduling and staffing problem with multiple variables subject to specified constraints. Beaumont (pp. 483-484, section 7: Implementation) discusses the use of mixed integer programming to generate optimized staff scheduling in near real time in order to model a complex management and planning problem to increase efficiency and reduce cost.
16. As per claim 3, the combination of Green and Beaumont discloses the system of claim 2. Beaumont further discloses that the said optimized solution is obtained by solving a mixed integer programming model having at least one objective function (p. 478, section 3.4: The Objective Function), and comprised of decision variables, constraints, parameter values, and configuration settings developed from relevant scheduling problem data (pp. 476-p. 480, section 3: Formulation).
17. Beaumont does not expressly disclose that the decision variables and constraints are developed from said employee data, said leave requests, and said transfer requests.
18. That the decision variables and constraints are developed from said employee data, said leave requests, and said transfer requests is irrelevant since the intended field of use does not change the overall functionality of the system. The decision variables and constraints can be developed from any data relevant to a variety of optimization problems. The intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).
19. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain the optimized solution of claim 2 by solving a mixed integer programming model having at least one objective function, and comprised of decision variables and constraints developed from said employee data, said leave requests, said transfer requests,

said parameter values, and said configuration settings in order to compare and contrast different business scenarios and make business decision accordingly. Beaumont (p. 483) discusses the benefit of modeling data to validate or invalidate the models and solutions.

20. As per claims 4-9, the combination of Green and Beaumont discloses the system of claim 3 as discussed above, but does not disclose the system of claim 3 wherein said constraints include the seniority transfer processing constraints as recited in claim 4, the full period leave seniority processing constraints as recited in claim 5, the half period leave seniority processing constraints as recited in claim 6, the transfer/last half period leave seniority processing constraints as recited in claim 7, the transfer/first half period leave seniority processing constraints as recited in claim 8, and the transfer/last half period leave seniority processing constraints as recited in claim 9.
21. However, Beaumont discloses various constraints applied to the staff scheduling optimization problem (p. 478, section 3.5: Constraints). In addition, it is old and well known in the optimization art to apply constraints that limit the set of feasible solutions.
22. That the claimed constraints discussed above in paragraph 20 include specify period leave seniority processing constraints applicable to the employee transfer and leave optimization problem is irrelevant since the intended field of use does not change the overall functionality of the system. The constraints are interchangeable with a different set of constraints appropriate and relevant to a variety of optimization problems.
23. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply constraints that limit the set of feasible solutions in order to model various scheduling scenarios for comparison. Beaumont (pp. 481-482) shows that the system executes multiple iterations and (p. 483) discusses the benefit of modeling data to validate or invalidate the models and solutions.

24. As per claim 10, the combination of Green and Beaumont discloses the system of claim 2.

Beaumont further discloses that the said optimization processor is parameter driven (p. 476, section 3: Formulation; The system processes parameters) and may be executed plural times with different parameter values and configuration settings to generate a variety of solutions from which a user can converge toward an optimal solution (pp. 481-482, section 5: Results; The system executes multiple iterations to generate a mixed integer programming solution based on varying parameters and configurations).

25. As per claim 11, Beaumont discloses the system of claim 2, wherein said optimization

processor is operated with distinct sets of parameter values and configuration settings (p. 476, section 3.1: Parameters and Indices; The system processes sets of parameter values. p. 480, section 4: Numerical Solution; The system includes configurable settings such as perturbation) to determine which of said distinct sets meets staffing requirements in such a way that future staffing levels are not compromised (p. 481, section 5: Results; The system executes mixed integer programming solutions in order to determine the distribution of shift starting times, and the number and the type of staff member who should be employed on each shift to ensure shift coverage).

26. As per claim 12, Green discloses a method for processing employee leave requests, which comprises the following steps: receiving input data including said leave requests (col. 1, line 51-col. 2, line 8; Administrators and employees enter relevant data and leave requests into the system), employee data (col. 2, lines 3-8; The employee enters his/her data to access leave request utilities), parameter values and configuration settings from a user interface; and solving (col. 3, lines 30-35; The administrator enters parameters and configures system rules to direct system processing. Figure 5 shows a user interface for system administration).

27. Green does not expressly disclose a method for near real time optimized processing of employee transfer requests, new hire location assignments, and last half period new hire location assignments of an organization in managing employee staffing, which comprises the following steps: receiving said transfer requests; creating decision variables from said input data for use in a mixed integer programming model; generating constraints from said input data such that coefficient values are determined for said decision variables, and constraint sense and right hand values are determined for each of said constraints; and solving said mixed integer programming model to generate awards to employees.
28. However, Beaumont discloses a method for near real time optimized processing (p. 481, Table 2; Results of various runs shows that the system generates solutions in only minutes) of employee staffing and scheduling data in managing employee staffing, which comprises the following steps: receiving scheduling, staff, and other data: (pp. 483-484, section 7: Implementation; The system includes a user interface to allow data entry) creating decision variables from said input data (p. 477, section 3.3: Variables) for use in a mixed integer programming model (p. 474, section 1.2: Past Work; The staff scheduling problem subject to a particular set of constraints is solved by expressing it as a mixed integer program and generating a solution.); generating constraints from said input data (p. 476, section 3.2: Constraints) such that coefficient values are determined for said decision variables (p. 481, section 5. Results; Table 2 shows the determined values for variables), and constraint sense and right hand values are determined for each of said constraints (p. 478, section 3.5: Constraints; Constraint sense is determined as represented by mathematical equality and inequality symbols, and right hand values are given for constraints) and solving said mixed integer programming model to generate awards to employees (p. 481, Table 2; Results of various runs shows that the system generates scheduling solutions including scheduled shifts).

29. That the claimed method includes processing of data specific to an employee transfer and leave request optimization processor such as employee transfer requests, new hire location assignments, and last half period new hire location assignments is irrelevant since the intended field of use does not change the overall functionality of the system. The system could be used to process any data relevant to a variety of optimization problems. The intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).
30. In addition, generating constraints from input data such that coefficient values are determined for said decision variables is an old and well-known method in the optimization art. This process of generating constraints provides necessary scope definition for the problem. Determining coefficient values for decision variables facilitates problem resolution as values are discovered for unknown variables.
31. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to generate constraints from input data such that coefficient values are determined for said decision variables, and to include the processing of employee transfer requests, new hire location assignments, and last half period new hire location assignments in order to generate optimized scheduling solutions addressing specific business needs. Beaumont (p. 483, section 7: Implementation) discusses the importance of providing the ability to input or modify a variety of data to find solutions relevant to the specified problem.
32. As per claim 13, the combination of Green and Beaumont discloses the method of claim 12, but does not expressly disclose that said awards include only said transfer requests, and the step of solving includes determining new hire location assignments.
33. That the claimed method teaches processing of data specific to an employee transfer and leave request tool such as employee transfer requests, new hire location assignments, and last half period new hire location assignments is irrelevant since the intended field of use

does not change the overall functionality of the system. The system can be used to process any data relevant to a variety of scheduling optimization problems. The intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

34. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in the method the processing of employee transfer requests, new hire location assignments, and last half period new hire location assignments in order to generate optimized scheduling solutions addressing specific business needs. Beaumont (p. 483, section 7: Implementation) discusses the importance of providing the ability to change the input data to find solutions relevant to the business need by allowing the user to easily enter and manipulate data relevant to the problem.
35. As per claim 14, the combination of Green and Beaumont discloses the method of claim 12. Green further discloses that the said awards include only said leave requests (Green, col. 1, line 67-col. 2, line 2; The system awards employees vacation and holiday periods based on seniority).
36. As per claim 15, The combination of Green and Beaumont discloses the method of claim 12, but does not expressly disclose that the said awards include both said transfer requests and said leave requests, and the step of solving includes determining said new hire location assignments and said last half period new hire location assignments.
37. That the claimed method includes solutions specific to an employee transfer and leave request optimization processor such as awards that include both transfer requests and leave requests, and the step of solving includes determining new hire location assignments and last half period new hire location assignments is irrelevant since the intended field of use does not change the overall functionality of the system. The method can be used to derive

solutions with awards relevant to a variety of optimization problems. The intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

38. Additionally, it is well known in recruiting and staffing that in order to determine the employee transfer or vacation/ leave schedule, the newly hired employee assignments must be considered as the placement of these additional resources has an impact on the overall staffing schedule.
39. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to generate awards that include both transfer requests and leave requests, and the step of solving includes determining new hire location assignments and last half period new hire location assignments in order to adequate staffing coverage. Beaumont (p. 473, Abstract) discusses the importance of providing generating solutions that assist in workforce scheduling by determining how many staff to employ and when.
40. As per claim 16, the combination of Green and Beaumont discloses the parameter driven system of claim 1. Green further discloses means for modifying said parameter values to generate awards (col. 3, lines 30-41; The system user interface provides the ability to enter system parameters that determine how the vacation scheduler handles scheduling).
41. Green does not expressly disclose that the parameters generate parameter value sets from which the optimization processor generates corresponding award sets from which an optimal set may be selected.
42. However, Beaumont discloses parameters that generate parameter value sets from which the optimization processor generates corresponding award sets from which an optimal set may be selected. (p. 476, section 3.1: Parameters and Indices; Parameters such as the number of periods in a 24 hour day, and the number of shifts in each cycle are defined are

referenced. pp. 476-480; Beaumont discloses the use of parameters to generate an optimal solution).

43. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate in the system of Green means for modifying parameter values to generate parameter value sets from which said optimization processor generates corresponding award sets from which an optimal set may be selected in order to provide flexibility in the nature of the problems and applicable data presented to the system. Beaumont (p. 483, section 7: Implementation) discusses the importance of providing the ability to change the input data to find solutions by allowing the user to easily enter and manipulate data relevant to the problem.
44. As per claim 17, the combination of Green and Beaumont discloses the parameter driven system of claim 1. Green further discloses means for modifying said configuration settings to generate solutions (col. 3, lines 20-27; The administration object enables the user to configure system processing rules and settings).
45. Green does not expressly disclose configuration setting sets from which said optimization processor generates corresponding award sets from which an optimal set may be selected to avoid compromising future staffing requirements.
46. However, Beaumont discloses configuration setting (p. 480, section 4: Numerical Solution; The system includes configurable settings such as perturbation that influence optimization processing) from which said optimization processor generates corresponding solution sets from which an optimal set may be selected to avoid compromising future staffing requirements (pp. 483-484, section 7: Implementation; The system includes a user interface to allow data entry, configuration, data manipulation and processing, and generates a mixed integer programming model. p. 481, Table 2; Beaumont shows that the system generates multiple solutions from which one may be selected).

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47. That the claimed system generates award sets is irrelevant since the intended field of use does not change the overall functionality of the system. The system can be used to derive solutions with awards, schedules, or any other solution relevant to a variety of optimization problems. The intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).
48. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the ability to configure the system to direct the optimization processor to generate corresponding award sets from which an optimal solution may be selected in order to provide the solution that most efficiently accomplishes business objectives and avoids compromising future staffing requirements. Beaumont (p. 483, section 7: Implementation) discusses the importance of providing the ability to input or modify a system data as appropriate to address the specified problem such as meeting staffing requirements at a reduced cost.

### ***Conclusion***

49. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
- O'Brien (US Patent No. 6587831 B1) discusses a method for creating an employee schedule by assigning employees to shifts to meet staffing requirements.
  - Svoronos, et al. (US Patent No. 5802161 A) discusses a parameter-driven method of task scheduling and optimization.
  - Castonguay, et al. (US Patent No. 5911134 A) discusses a method for planning, scheduling, and managing personnel.

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- Ye (US Patent No. 6321207 B1) discusses a system and method for optimizing the allocation of a resource using integer programming techniques.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise Ferguson whose telephone number is (571) 272-6392. The examiner can normally be reached on Monday - Friday, 8 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

pf  
DF

June 13, 2006

Beth Van Doren  
Beth Van Doren  
AU 3623

**37 CFR § 1.105 - Requirement for Information**

1. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.
2. The information is required to:
  - a. extend the domain of search for prior art
  - b. document the level of skill and knowledge in the art of mixed integer programming in optimization.
  - c. identify products and services embodying the disclosed subject matter mixed integer programming
3. In response to this requirement, please provide all of the following:
  - a. the citation and a copy of each publication that any of the applicants relied upon to draft the claimed subject matter. For each publication, please provide a concise explanation of the reliance placed on that publication in distinguishing the claimed subject matter from the prior art. Of particular interest is the source of equations in claims 4-9. Which components of the equation and solution method are unique and which are common to mixed integer programming solution derivation methods? Did the inventor develop the equations? What materials were used to arrive at the equation? Are the equations from a printed publication? Please provide pages of any relevant publication.
  - b. a list of citations to electronically searchable databases or other indexed collections containing publications that document the knowledge within the disclosed art of mixed integer programming solution methodology as applied to optimization.
  - c. the citation and a copy of each publication that any of the applicants relied upon to develop the disclosed subject matter that describes the applicant's invention,

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particularly as to establishing and developing solutions to a mixed integer programming problem. For each publication, please provide a concise explanation of the reliance placed on that publication in the development of the disclosed subject matter.

- d. please state the specific improvements of the claimed subject matter in claims 4-9 over the disclosed prior art and indicate the specific elements in the claimed subject matter that provide those improvements.
  - e. the names of any products or services that have incorporated the claimed subject matter.
4. In responding to those requirements that require copies of documents, where the document is a bound text or a single article over 50 pages, the requirement may be met by providing copies of those pages that provide the particular subject matter indicated in the requirement, or where such subject matter is not indicated, the subject matter found in applicant's disclosure.
5. The fee and certification requirements of 37 C.F.R. § 1.97 are waived for those documents submitted in reply to this requirement. This waiver extends only to those documents within the scope of this requirement under 37 C.F.R. § 1.105 that are included in the applicant's first complete communication responding to this requirement. Any supplemental replies subsequent to the first communication responding to this requirement and any information disclosures beyond the scope of this requirement under 37 C.F.R. § 1.105 are subject to the fee and certification requirements of 37 C.F.R. § 1.97.
6. The applicant is reminded that the reply to this requirement must be made with candor and good faith under 37 CFR 1.56. Where the applicant does not have or cannot readily obtain an item of required information, a statement that the item is unknown or cannot be readily obtained will be accepted as a complete response to the requirement for that item.

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7. This requirement is an attachment of the enclosed Office action. A complete response to the enclosed Office action must include a complete response to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action, which is 3 months.
8. This Office action has an attached requirement for information under 37 C.F.R. § 1.105. A complete response to this Office action must include a complete response to the attached requirement for information. The time period for reply to the attached requirement coincides with the time period for reply to this Office action.

  
TARIQ R. HAFIZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600